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ABSTRACT

This overview of Japanese research on educational television and media education from the mid-1970s through 1985 begins by presenting a brief history of educational broadcasting and recent trends in broadcasting and related research in Japan. The following areas are reviewed: (1) research using program analysis; (2) research using test production and re-editing of programs; (3) research on teacher guidance and program effectiveness; (4) research on the measurement and evaluation of viewing abilities; (5) research on the development of viewing abilities; (6) development of curricula for media education; (7) development of new programs for very young children; and (8) practical studies by teachers on education by broadcasting. One English-language and 77 Japanese references are listed. (MES)

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Trends in Research on Japan's Educational Broadcasts

NHK Broadcasting Culture Research Institute

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Trends in Research on Japan's Educational Broadcasts

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TRENDS IN RESEARCH ON JAPAN'S EDUCATIONAL BROADCASTS

Abstract

This is a summary of research on school broadcasts, programs for pre-school children, and other media education in Japan from the mid-1970's through 1985.

Many studies conducted during the 1960's focused on how education could be improved through the use of school broadcasts, but these generally dealt with only one or two programs. After the beginning of the 1970's, however, more studies analyzed the contents of programs, adding criticisms and comments and even producing test programs. Such studies discussed programs in terms of their subject, mode of presentation, camera work, composition (i.e., overall plan), photographic techniques, and editorial techniques.

As for the study of children's responses to programs, some researchers used the conventional questionnaire method, while others tried to gather data on children's viewing activities by use of program analyzers and the study of psycho-physiological reflexes such as brainwaves and Galvanic Skin Response. Some researchers used pictures rather than words in such studies.

Research on the measurement and evaluation of picture-viewing abilities was one of the most fruitful fields during

the past decade; a large number of studies and suggestions were made.

To study how children develop picture-viewing abilities, researchers showed pupils in different grades the same school broadcast program, and then tested their ability to understand the special "expressions" of its images. Thus we are now gradually coming to understand this developmental process.

Another characteristic of recent research is the growing interest not only in education by media but in education concerning media. One such study was conducted by the group led by Takashi Sakamoto, and another was done by the group led by Teisuke Yoshida. Their findings have already been put to use in classrooms.

Also noteworthy is research by the Two-Year Old Children's Television Program Study Association. This group continues to test-produce and broadcast new programs designed for very young children, with the cooperation of other program producers and researchers.

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I. Introduction

Since 1925, when radio broadcasts first started in Japan, educational programs have been an important part of broadcasting in this country. A radio course on English was begun as early as the summer of 1925.

However, as long as educational programs were directed at people at home -- such as the "English Course" and "Women's Culture Course" -- almost no studies were done on the effects of such programs. The year 1935 saw the start of school broadcasting, and this drew much more attention from researchers. Even as far back as 1933, two years before school broadcasts were officially begun, Morihei Ochiai published a research paper titled "An Experiment with a School Broadcast at the Hokkaido Branch Station".(1)

The situation has not changed much today: there are still very few academic studies on the contents and educational effects of lecture programs or hobby-culture programs for adults. On the other hand, there are many surveys and studies concerning programs for kindergartens and schools; recently the number has reached several dozen every year.

When programs are directed to those studying at home, the viewers include a wide range of ages and backgrounds, and generally have little knowledge of teaching methods and materials. Even if such programs have no appreciable

educational effects, the viewers' own lack of ability or effort might be blamed; and dissatisfied viewers can always switch to other educational media whenever they wish. Thus there has been little criticism of adult educational programs. People who study at home usually just want to raise their general cultural level, rather than to reach a set academic goal. They also expect to enjoy themselves while learning, rather than simply increase their academic ability. This is why researchers find it hard to gauge the educational effectiveness of such programs.

On the other hand, in the case of school broadcasts, teachers are always present as mediators between the programs and children. Teachers are professionals in the use of educational methods and teaching materials, and school broadcasts are used as part of classes that are carefully planned by teachers. School lessons always have goals to be attained; neither teachers nor pupils come to school simply to enjoy themselves. Therefore, the quality of school broadcasts is always checked through the eyes of professional teachers. Furthermore, research groups studying educational methods and contents -- such as those specializing in various fields of educational psychology -- are also naturally interested in school broadcasts.

In short, because school broadcasts are constantly scrutinized by educational professionals, the quantity and

quality of studies on school broadcasts far exceed those for programs in all other genres.

The author attempted to survey in 1977 the various studies to date on school broadcasts.[2] During the same period, the author also reviewed various research about studies on the effects of TV school broadcasts.[3] Then, in 1983, the 30th anniversary of the start of Japan's TV broadcasting, the author again catalogued and analyzed various studies on the effects of TV school broadcasts.[4]

Since then, new trends have been emerging. Research on school broadcasts has come to focus on the effects of new media. Furthermore, there is more research on ways to study and teach about media, and a number of curricula for media education have been published.

Besides continuing research on school broadcasts, now there are also more developmental studies on programs for pre-school children, and the results have been reflected in recent program production.

In this report, the author surveys research on educational programs (both school broadcasts and programs for pre-schoolers) conducted after the mid-1970s, and attempts to examine the main trends.

One characteristic of the research on school programs in Japan is the huge accumulation of studies based on practical experiments and other records by teachers in the

classroom. These include a number of studies jointly conducted with university-based researchers. Many studies by kindergarten and school teachers have been published every year in connection with broadcasting educational study assemblies, study and training meetings, national assemblies on broadcasting education, and other forums. In fact, it has become nearly impossible to collect all such studies. Fortunately, those which won a prize from the All-Japan Teacher's Federation for Studying the Use of Radio and Television in Education, awarded every year since 1964, were published in "Investigations on Broadcasting Education" (Vols. 1-21). As of 1985, the title of this publication was changed to "Theses Awarded the Broadcasting Education Prize."

In short, the theoretical development of Japan's broadcasting educational has been supported by both scholarly research conducted with refined techniques, and by the studies of schoolteachers, based on their daily classroom experience.

In addition, there are two other large fields of research concerning education and broadcasting: (1) studies on the use of broadcasting by communications senior high schools, and (2) studies on the Universtiy of the Air, which began operating in 1985. Since analysis of the current situation and the collection of various research is

still in progress, the author will not deal with either of these fields in the present report.

II. Research on Educational Broadcasting

1. Research Using Program Analysis

Research based on analysis of the content of TV programs is still comparatively scarce in Japan. Such studies of programs meant for the general public include the quantitative analysis by Sumiko Iwao, of violent scenes in dramas,[5] the analysis by Yasuko Muramatsu et al of dramatic programs for women,[6] and the continued survey of television commercials by FCT, the Forum for Children's Television, represented by Midori Suzuki.[7] In the case of school broadcasts, most research on guidance of teaching techniques and on the effects of programs generally accepted the content of the programs as is, without making any content analysis.

Hirohisa Ogawa[8] suggested that children in kindergartens and nurseries did not adequately understand programs broadcast for them, so he called for more analysis of the contents of programs and textbooks.

Then, starting around 1975, more and more researchers began to analyze programs, study children's viewing responses

by various methods in connection with such analysis, consider the effects of broadcasting education from that angle, and sometimes make suggestions for improvement.

Morio Oda et al [9] used the ethics program, "Happy Friends: Wedding March," in a survey on how the program's basic conception, composition of important scenes, and emotional approach affected 5th and 6th graders in primary school. The researchers first made the children watch the program, then immediately gave them tests regarding its conception, important scenes, and their emotional responses. After about one week, the children were shown the same program and given the same tests again. As a result, it was found that the children were generally not moved by several important scenes in this program, and a repeated viewing did not change their response. In addition, reactions varied widely according to sex and age. Therefore, the researchers were able to suggest a number of possible changes in the program's composition, to help children understand its theme of the need for perseverance.

From the mid-1950's to the mid-1960's, many studies were conducted at NHK's Radio and Television Culture Research Institute (the present Broadcasting Culture Research Institute) using a program analyzer; [10] these provided much information to producers who were eager to develop new programs. Since

then, however, use of a program analyzer has declined, except for a few studies by Yoshihisa Ogura et al.[11] The reason is presumed to be that a program analyzer is suitable for studying and evaluating a specific program, but it is difficult to generalize such results. Around 1975, however, Sachiko Imaizumi used an analyzer for the study of English lesson programs,[12] and Masahiro Murakawa et al[13] also used it in 1983 for analysis of "The Green Earth," an ecology series for schools.

Murakawa, with Tsuneoki Kono et al, showed children a program and then tried to clarify what scenes heightened their emotional responses, what scenes were understood correctly, and how sound effects were related to these responses and understanding. Then, based on their results, the researchers considered what explanations teachers should give the children and what related activities they should encourage. After using "The Green Earth: A Living Beach" for their survey program in May, 1983, the researchers cited the following nine items for analysis.

A. Subject		Image information
B. Mode (Presentation using location films, studio shots, etc.)	Image effect	
C. Camera work		
D. Shot-size		
F. Subtitles, etc.		

G. Sound effects

H. Voice information

I. Aim of teaching

After analyzing the program second by second regarding the above nine elements, using a program analyzer, the researchers showed the program to a class of 6th graders. Then they gathered responses regarding emotion ("Wow! It's terrific!," etc.) and acknowledgement ("I see. Now I understand," etc.), as well as responses regarding the nine elements listed above (which had actually been subdivided further.) Then they examined the correlations.

As in this research by Murakawa et al, Hiromi Yamaguchi[14] conducted her research by analyzing a program in terms of a number of elements; then she analyzed the difference in the functions of teachers and children appearing in television programs.

For ten installments of the "Science Class for 5th Graders," Yamaguchi used four categories of analysis: "verbal activities," "pictures," "scene classification," and "stages of process." She established 43 subcategories as follows: 18 subcategories under the category "verbal activities," including "explanation," "anticipation" and "addressing"; 14 subcategories under "pictures," including

presentation techniques such as "picture of a teacher alone," and "specially-taken location film," and photographic techniques such as "close-up," and "zoom-in," as well as music and sound effects; seven subcategories under "scene classification," such as "introduction," "experiment," and "formularization of the subject"; and four subcategories under "stages of process," including "grasping of phenomena." When she analyzed the 5th-grade science programs according to these categories, she made clear the relationship between pictures and verbal activities, and also the program pattern of anticipation → experiment → formularization. She stated that this pattern shows a more standardized development than classroom lessons.

The research group led by Hirohisa Ogawa et al[15] raised a question about the so-called "basic principle" of broadcasting education, stating that analysis and criticism of the programs themselves had not been made because this principle called for school broadcasts "to be live, total and continuous." They thus started analyzing the texts and examining the contents of programs for pre-schoolers such as "Friendly Rhythem,"[16] "Can You Do It?"[17] and "Hey, Hanimaru!"[18]

Yoshiyasu Ogasawara and Yasuko Kurihara,[19] on the other hand, proposed to analyze the characteristics of

individual TV images. They published their analysis category system, in which the "makeup of scenes" was analyzed in terms of planning, photographic technique, and editing technique. Furthermore, programs were analyzed in terms of "makeup of scenes," "connection of scenes," and "sound track." Then Ogasawara et al analyzed the "World for All" by this method; and they made the criticism that this program did not take into account "children's observation and process of inquiry," so it was more like a mere picture-book.

Besides these researchers, Takeya Saito and Takashi Sakamoto[20] analyzed six programs and video-taped social studies teaching materials (meant for children in the 1st through 6th grade) by the "Temporal Order Condition Analyzing System" developed by the Tokyo Institute of Technology. Children, corresponding in age to those targeted by these programs, were tested to determine the extent of their understanding and interest. The researchers classified the programs according to five different characteristics (format, pictorial characteristics of the performers, voice characteristics of the performers, pictorial techniques, and miscellaneous factors) which were further divided into 27 constituent elements. Then they examined the relations between these elements and the children's analyzer responses.

Attempts have also been made to analyze how pictures

affect viewing students not from conscious responses (such as verbal statements or analyzer records) but rather from physiological reflexes such as GSR (Galvanic Skin Response, i.e., changes in the electrical resistance of the skin resulting from the activity of sweat glands due to excitement.)

Jun Yoshida and Akio Hoshino[21] showed twelve university students two programs, "The Burning of a Candle" and "Magnetic Fields Created by Electric Current," presented on the TV screen in two different ways--as written explanations and as continuous pictures (neither had a sound track.) Then the researchers recorded the students' brainwaves while they were viewing the programs, and learned that the pictures aroused more response than the written words.

Yoshida[22] continued his experiments by recording four separate responses of subjects--brainwaves, vocal cord vibrations, heartbeat, and behavior. Then he examined how the responses of the subjects differed while viewing a science program (concerning "weight") if they were given a problem to solve before viewing. Yoshida's factor analysis of such data suggests that when the subjects were shown programs while thinking of some specific problem they had to solve, their level of attention rose, and their understanding of the picture content improved.

Besides these researchers, Katsunobu Matsumoto[23]

(whose work is discussed in further detail in Section 3) showed children a science program while measuring their pulses, brainwaves, and cornea-retina electric potential reflexes. Setsuko Kozuki and Yoshinori Yokoo et al,[24] showed both a school ethics program ("A Growing Child,") and a popular cartoon program ("Doraemon") to 120 primary school children and 44 physically-handicapped children while measuring their GSR.

The researchers concluded that the GSR response to "The Growing Child" gradually rose toward the end of the story among the normal primary school children of all grades, while excitement was lacking at the climax of "Doraemon." As for the physically-handicapped children, the higher their grade in school, the more closely their responses resembled those of normal children.

To summarize, various methods have been used to study the relationship between the contents of programs and viewer response, such as use of a program analyzer, descriptive analysis of the program contents, and studies on psycho-physiological responses. There are other possible approaches as well. For example, Tairiku Isaji[25][26][27] adopted the method of showing pre-school children and grade-school pupils both school ethics programs and some programs he had made himself, then making the children express the images with

key-words, to examine the development of their viewing ability. Noriyuki Araki and Shinji Yaegashi[28] recorded responses to the program, "Science for Junior High School," by making the children record their emotions and level of interest in their required notes on school broadcasts. He discovered significant correlations between such responses and their academic records in science courses.

The main purpose of the various studies by Isaji, Araki and others (as well as research by Miyake, Kodera et al, which the author will discuss later) was to examine the response and understanding of students. From the producers' standpoint, these provide excellent data to clarify whether the producers' aims are being achieved.

As seen in the research by Saito and others, various kinds of response-analyzing equipment, combined with computers, now open the way to ever more sophisticated program analysis in the future.

2. Research Using Test-Production and Re-editing of Programs

Like the research conducted by Iwao and others in the late 1950's, and the studies by Imaizumi mentioned above, several teams have recently published reports on the use of specially produced test programs, or broadcast programs re-edited to suit the purpose of the experiments.

Toshifumi Tada, Fumihiko Shinohara et al[29] produced two kinds of science study programs (dealing with changes in geological formation) using the same producers and participants as in NHK's "Science Classroom for 4th Graders," which was then being broadcast. One of their experimental videotapes (VTR 1) was the same as an ordinary science program, but the other (VTR 2), specially made for the experiment, introduced on 24 occasions words and gestures designed to help children form a clearer image of the program contents. These two videotapes were shown to a group of 5th graders and also to second-year students in junior high school. The order of the experiment was as follows: preliminary test → VTR 1 viewing → Test 1 → VTR 2 viewing→ Test 2. The results showed that image-formation tended to be far more active among the 5th graders than among the junior high school students .

Another study which involved making an experimental program and manipulating the pictures and soundtrack was conducted by Manabu Kobayashi, Joji Kameyama et al[30]. They worked with a 4-minute videotape ("The Sex Pheromones of Silkworms," produced by the Gakushu Kenkyu-sha Company), which is used in biology classes in senior high schools.

A control group of senior high school students were shown the original program as is (pictures plus soundtrack),

while the experimental subjects were shown the same program without narration. Then, after one day, one week and one month, respectively, the two groups of students were told to list what they had seen, what they had understood, and what they had felt. Members of the experimental group who watched the voiceless video listed more items seen. However, the control group students listed more items in the categories of understanding and emotional response.

Some studies involved changes in voices and written words, to examine the children's style of information processing. These studies include the research by Kobayashi et al mentioned above, and also that by Moritaka Mino and Noriyuki Araki.[31] They adapted a 10-minute 8-millimeter film ("The Tiger--Lord of the Jungle") for experiments comparing spoken narration with subtitles. Some information was given only in the narration, while other information was contained only in subtitles. In their survey of five groups (totalling 162 children) in the 2nd, 3rd, 4th, 5th and 6th grades, respectively, the researchers tested the children on their understanding of the information given by voices, information written on the screen, and information conveyed by the pictures. There was not much difference among the different grades regarding the voice information, but in the case of the written information, there was a clear

difference between the 3rd and 4th graders. Regarding the pictures, there was a clear difference in the level of understanding between the 5th and the 6th graders.

Naomi Miyake and Newman[32] also conducted an experiment using a program they had made in which a certain concept was presented repeatedly. They concluded that such repetition may not be really effective, particularly for young children, unless there is some "clue" to make clear that the repetitions in fact deal with the same concept. (This was an international comparative study, using young children in both Japan and the United States.)

As pointed out by Tada et al, it is impossible to make a test-program of the same quality as broadcast programs without cooperation by producers in a broadcasting organization. However, the experiments must deal with the makeup of the program (pictures and voices); otherwise the program analysis may end only in superficial criticism. As discussed in section 7, developmental research is being continued with test-programs for very young children, and the resulting data is being used in the actual production of broadcast programs. It is hoped that more and more research will also be conducted with the test-production of school broadcast programs, with similar feedback of data for actual production.

3. Research on Teacher Guidance and Program Effectiveness

During the past several years, a number of experiments have been conducted on introducing teachers' comments before and after children's viewing of programs. Even Yoshida's analysis, mentioned above, of the brainwaves of children given some problem to solve before their viewing may also be called research into teaching methods.

Katsunobu Matsumoto[33][34] carried out a comparative study on the relation between the presence or absence of viewing experience and study effects, using six classes of children from the 1st to 6th grades, who had been steadily viewing the "Science Classroom" programs (Group A), and also six other classes of children in the same grade level who had no experience of studying through TV programs or of viewing this particular program (Group B). He showed each of these groups of children from four to six installments at one time of the "Science Classroom" series, then asked them to write down their answers to six questions in free essay style immediately after their viewing. Matsumoto classified the logical development of each installment in five stages: "initial phenomena," "identifying problems," "discovering methods for making experiments and finding solutions," "experiment and observation," and "study of the results." Analyzing the content of the children's essay-style

answers, in the case of the 4th graders he concluded that children in Group A, who were used to such programs, could grasp their logical development, but such comprehension was difficult for those in Group B, viewing such programs for the first time. Furthermore, children in Group A could form more vivid and appealing images than those in Group B; and the Group A children were also better able to understand the scenes on identifying problems, and discovering methods for experiments. Matsumoto presented these results to confirm the advantages of consistant viewing of school broadcast programs.

Like Matsumoto, Keiji Ishikawa[35] dealt with the assumption that continued viewing of broadcast programs would improve children's ability to understand them. He compared the viewing ability of the children who had been watching in class a social studies series for 5th graders, titled "TV Travels" (Group A), with the viewing ability of those who had no such experience (Group B.) He showed an installment to these two groups, and surveyed their understanding of the main subject of the program, and reactions to important and impressive scenes. Again, he found significant differences between Groups A and B. Ishikawa also noted that children in Group A were given advice by their teachers about the kind programs they should watch at home, and he

thcught this was another factor which improved their viewing abilities for school broadcasts.

In short, the effectiveness of school broadcasts depends largely on the content of the programs, the children's viewing experience, and teacher guidance immediately before and after viewing. But there are other factors as well. Jun Hosoya and Koichi Abe et al[36] pointed out that children need basic knowledge of the physical world around them before they can progress to an understanding of society. They showed a social studies program, "Men at Work: At an Iron Mill," to two groups of 2nd graders which each had different experiences in the study of metal. The children in Group C had studied textbooks which made no effort to relate natural and social phenomena. In contrast, the children in Group E had studied a textbook which discussed natural and social phenomena together; furthermore, their teachers had helped the children learn about iron through their five senses. The researchers attempted to clarify the effect of previous study experience on reactions to school broadcasts by this method: (1) a survey before viewing → (2) viewing → (3) a survey after viewing. Their results showed that Group E excelled in the study of iron manufacturing regions. For questions about the machinery in the iron mill, all children in the E group showed a high rate of correct answers; but

among the C group children, only those who said they were fond of television gave a high rate of correct answers. By combining the results of this experiement and those of other experiments, Hosoya et al pointed out that, in order to make effective the school lesson using the TV program on the iron mill, the contents of the preceeding science study lesson were quite important. They stated that the results of these studies showed the interrelationships among the students' attitudes (whether they were fond of television or not, etc.), their degree of academic achievement before the experiment, the range of teaching meterial and the teaching strategy. Thus proper planning of lessons before showing the TV program can help compensate for certain disadvantages.

Among the studies into the effects of introducing the teachers' methods as a variable, Tadahiko Goto and Hideomi Kobayashi et al[37] showed the program "Green Earth" to three groups of children, alternating factors in the program and in teaching methods for each group. (There was also a control group who had not been shown the program before.) The children were told to close their eyes immediately after they were shown the television program, and to raise a hand as soon as they could "recollect" the pictures. The researchers stated that such recollection after viewing a television program promotes image-formation;

and that among junior high school students, the difference between the group who were asked to recollect and those who were not was particularly large.

Taisei Kondo[38] examined experimentally the effects of repeated viewing of the same program, as a teaching method. Accepting the theory that one hemisphere of the cerebrum (commonly known as the left brain) deals with linguistic information, and the other hemisphere (right brain) with pictorial-figurative information, Kondo assumed that television pictures are recognized by the right brain as total patterns. He then set up the hypothesis that when the same program is viewed again and again, pictorial recognition might shift to linguistic recognition. He reported that by repeatedly showing various kinds of television school broadcasts to 37 1st graders, he could obtain the results he had expected.

Kakutaro Fukumoto et al[39] also conducted research in which teachers' guidance and previous experience were correlated with the effects of broadcasting education. That study focused on the effect of "addressing" kindergarten children by use of television. In addition, Hiromi Sajima[40] showed several television social studies programs to 3rd graders in three groups--a "free observation group," a "guided observation group" and a "study guidance process observation group," -- and confirmed the effects in each group.

In research into broadcasting education during the mid-1960s, there were a number of comparative studies on teaching methods, such as studies on continued use vs. non-continued use, or total use vs. partial use. However, since the mid-1970's, there have been only a few such studies, including those introduced above. This is probably because, partly due to the progress in research on broadcasting education and also to the influence of various research abroad, it has come to be widely accepted that the teachers' guidance method is only one among many factors, including factors within the program itself and the students' ability and aptitude. In the classroom, teachers cannot control such factors within the program or the students . Thus, instead of fixed doctrines about guidance methods, it seems that more attention should be paid to treating students in ways suitable to their attitude and aptitude.

4. Research on the Measurement and Evaluation of Viewing Abilities

Television is basically the presentation of information by means of images; a program made up only of narration and/or lines of text is no longer really television. (Teletext broadcasting is outside the sphere of this report.) But when information is transmitted and received as pictures,

a number of special problems arise. Rather than expressing the broad concept of mankind, pictures must show specific individuals. Likewise, "automobile manufacturing" may be presented on film, but it is difficult to express the concept of "industry in general" without using words. Pictures imply the present, but not the past or future. They express affirmation but not negation. Pictures in themselves do not express concepts like "and," or "but," so viewers must imagine for themselves how the pictures are connected.

TV program producers employ various techniques such as montage, high-speed photography and microphotography to expand the expressive ability of pictures. But how do people learn to understand such approaches? Just as reading ability can be developed by education, isn't some training needed to acquire picture viewing ability?

In fact, the importance of developing viewing ability in broadcasting education has long been recognized. Nevertheless, for many years, there were a number of unanswered questions, such as "What are the basic elements and structure of viewing ability?" and "How is it related to intelligence, academic ability and personality?" Obviously, research was needed on how to analyze and assess viewing ability.

have continued since the early 1970's their research on how TV viewing can stimulate children's curiousity and broaden their world view, by using the school broadcast series "Green Earth" and some general programs.[42] Recently this group has expanded its studies to include the evaluation of viewing ability and the development of media education curriculum.

In a study conducted during 1979,[43] they showed 164 children of 3rd to 6th grade 20 installments of the "Green Earth" series at regular intervals, and gave them tests about several of these installments both before and after viewing, along with Conception Style Tests (CSTs).

As a result of this experiment, various methods to measure and evaluate viewing abilities were developed and put to practical use. These include tests to study the fixation of conceptual knowledge, to evaluate the systematization of knowledge, to assess the quality and quantity of the images obtained by viewing teaching materials, to measure ability to understand the producer's aims, and to record emotional responses (the SD Method). With these tests, Minakoshi et al stated that they could gain statistical data on viewing abilities, and determine the correlations between each element of these abilities. They listed such elements of ability as follows:

(1) To recognize pictures

(2) To reproduce the proper sequence of pictures

(3) To distinguish present and past, and a whole and its parts
(4) To recognize the end of a sequence
(5) To realize which scenes are important
(6) To grasp the theme/subject of the program
(7) To anticipate developments
(8) To systematize and reconstruct information
(9) To relate new images to past experiences, and to generalize
(10) To form one's own images (visual and auditory)
(11) To add one's own emotions
(12) To be inspired with interest and enthusiasm

Shotaro Miyake, Hideo Kodera et al[44] further developed the above-mentioned research by Minakoshi et al. They insisted that while the evaluation of viewing ability is of course centered on understanding the content of pictures, viewing ability should also be considered the ability to express and construct. From this viewpoint, they developed new ways to measure and evaluate viewing ability, and attempted to assess the development of such ability according to grade level. The researchers studied viewing ability from three angles--"memory of pictures," "understanding of pictures," and "expression of pictures." They assumed that

"memory of pictures," serves as the basis for "understanding of pictures," and that "understanding of pictures" serves as the basis for "expression of pictures." While previous researchers had evaluated viewing abilities mostly through written tests, Miyake et al thought it necessary to use images in making their evaluations.

Previously, Toshifumi Tada[45] had used an experimental test program, based on the school broadcast series "TV Travels," for the purpose of studying children's viewing ability developmentally; he assessed their understanding of multiple image-producing techniques, montage, and so on. On the other hand, Miyake et al classified pictures as either "descriptive" or "narrative" in their research. As "descriptive" pictures, presented to promote the children's logical understanding, they used a social studies school broadcast program for 2nd graders titled "Work for All: Growing Trees" (broadcast in September, 1982.) As "narrative" pictures, presented to broaden the children's inner world through sympathetic understanding of characters' emotional states, they used a puppet play titled "A Cow Who Loves Flowers," which they had produced themselves.

In Survey I, they checked on whether, after viewing "Growing Trees," could arrange photographs in the order of "seed-sowing," "tree-planting," "weeding," "felling," and

"taking out." Four test-tapes were made by putting together the pictures from the original program in different ways, and the children were then asked to choose which one of the test-tapes best expressed the theme of the program.

As a result, the researchers obtained data which showed that the ability to understand the structure of a program develops remarkably from the 2nd to 4th grade in primary school, and the ability to grasp the theme develops very much from the 4th to 6th grade.

In survey II, involving a total of 323 children from the 3rd and 5th grade in primary school, the researchers investigated both the children's ability to reproduce the scenes and their "sympathetic understanding" of the main character of the puppet play. The results showed that the children generally understood the producer's concept of the main character, and this ability improved with grade level. However, the children who responded with considerable emotion did not necessarily excel in sympathetic understanding.

From the above two surveys, Miyake and Kodera et al concluded that: (1) they could measure and evaluate viewing ability, such as the ability to grasp the theme of a program, by means of images alone, although written tests had been considered necessary before; (2) they could clarify children's development of viewing ability by grade level and accordingly

could find ways to establish an evaluation standard for picture expression.

In their second study, Miyake, Kodera et al,[46] classified viewing abilities according to the elements of the program, and again attempted to measure them by using image-questions. They used the same programs as in their first study, "Work for All: Growing Trees" and "A Cow who Loves Flowers." Using pictures, they posed ten questions to examine the children's re-recognition of sound effects, re-recognition of scenes, understanding of program structure, grasp of the theme, and so on. This survey involved a total of 540 children from the 2nd to 6th grade. Again, the rate of correct answers improved with the advance in grade level.

Then Miyake, Kodera et al conducted a third study,[47][48] using the same two programs and ten new questions using pictures. They surveyed a total of 5,000 children from the 2nd to 6th grade in four parts of Japan--Tokyo, Osaka, Ishikawa and Okinawa. In this new research, they improved the accuracy of the data by using larger samples, and checked the adequacy of the test questions used for evaluation. In addition, they gave Japanese language tests and intelligence tests, and investigated the correlations between the results of these tests and the children's viewing abilities.

The results of this study showed that (1) the average marks showed significant differences in each grade in the different districts, as well as in the low, middle and high grades, with the difference being particularly marked in the combined points of picture information and recognition ability; (2) children with considerable experience of watching television in class showed superior viewing abilities compared to those with only some experience; (3) no appeciable relation was recognized between the children's ability in "hearing, reading and understanding" and their viewing ability; and (4) viewing ability had no relation at all with "memory" in intelligence tests.

While Miyake et al investigated methods of measuring viewing ability by use of both a school broadcast program and a program they made themselves, new research by Toshiyuki Minakoshi and Masahiro Murakami et al,[49] aims at developing viewing-ability evaluation programs and other evaluation methods for international comparisons of viewing ability.

The researchers used three programs--a Canadian cartoon, "The Improvised Poesy of Lines and Colors;" a Japanese cartoon, "Nesting Cranes;" and an American documentary, "The Winter Life of Eskimos." In the first stage of research, four groups of Japanese children (a total of 1,811 from the 5th grade in primary school to the second year of junior

high school) were shown these three programs and tests were conducted. The children's images formed from these programs and their emotional responses were checked by means of association words; ("cheerful--dismal," "happy--sad," etc.) When they were shown "Nesting Cranes," the program was stopped in the middle, and the children were asked to guess the rest of the story by themselves. The images obtained by watching these programs were reportedly more numerous and detailed among junior high school students than primary school pupils, while the emotions created by the programs differed by sex and by grade, being stronger among girls and those in lower grades. This same survey was also conducted in Singapore, England and Sri Lanka, using the same programs.(50)(51) In particular, the viewing abilities of Japanese children and those of Sri Lanka were compared, and a number of differences were described.

5. Research on the Development of Viewing Abilities

Not all children can realize what an image is all about simply by looking at it; a child's viewing ability develops with age and progress in school. Miyake, Kodera et al have clarified this point through the various analysis methods described above. The studies by Mino and Matsumoto discussed earlier in this paper also take into account the fact that

children's understanding of images develops with their growth. And during the past several years, a number of studies have been published on the relationship between children's age and their understanding and memory of images.

Mitsuhiro Higashida and Tsuneoki Kohno[52] have studied the development of children's understanding of images in an experiment involving 850 students in six different grades, from the 4th grade in primary school to the 2nd year of high school. They showed the students a TV program in a science series designed for senior high school students (titled "Animal Behavior: The Conditioned Reflex") and they tested the students both before and after viewing. This program takes up 14 kinds of conditioned and unconditioned reflexes, shown in both moving and still pictures. From analyzing the results of the tests conducted before and after the program-viewing, the following points were clarified:

(1) Under appropriate conditions, even the primary school children were able to recall the scenes of the program quite well. The difference in recollection rate between the primary school and the senior high school students was less than 20 percent.

(2) As for ability to grasp the contents of the program viewed, the difference between the primary school and the senior high school students was just about the same as the recollection ability.

(3) However, as for ability to explain the concept of the "conditioned reflex," there were big differences according to grade level.

(4) Hardly any correlation was observed betweent the students' viewing abilities and their attitudes toward science courses. From this, it seems clear that learning the subject by means of image media is effective even for the "science haters."

Yoshiaki Kohno[53] has conducted a study on image-perception by using a 19-minute puppet play titled "The Wild Roses." A total of 201 children in the 2nd, 3rd, 4th, 5th and 6th grades were shown this program and, after the viewing, they were given image-perception tests. To minimize the need to explain the images in words, the children were given one test using still photos, and then a non-descriptive multiple-choice type test.

In the first test, the children were given a number of photographs showing different scenes from the program and asked to rearrange then in the right order; this was designed to check how well the children has grasped the story of the program. In the second test, to check how well the children understood the individual scenes, they were shown a still photo of each scene and asked to surmise the mental state of each character in that scene.

In the test asking the subjects to rearrange the photos

in the right order, those that solved the problem correctly amounted to only 7.7% of the second graders and 7.5% of the 3rd graders--but the percentage jumped to 40.5% in the case of the 4th graders. For the higher grades, the percentages were much the same as that for the 4th grade. Obviously, as far as recollection of the story was concerned, the biggest difference appeared between the 3rd and the 4th grade.

As for the grasping of the different scenes and the emotional state of the characters, the ratios of right answers were almost equally high for all children from the 2nd to the 6th grade; even the 2nd graders showed a correct-answer ratio of more than 90%. Concerning this point, Kohno writes: "The images, unlike written texts, contain additional elements of color and music as well as non-linguistic information such as gestures and facial expressions, so, even for children in the lower grades, understanding the story or the emotions of the characters must have been quite easy." However, a substantial difference according to grade level was apparent in responses to other questions designed to find out how well the subjects grasped the changing thoughts and feelings of the characters. These questions referred to a scene meant to indicate a dream, a scene in which death was suggested by changes in color and music, and a scene in which images were overlapped to suggest the character's

memories of home. On understanding of these scenes, the correct-answer ratios were only 33% for 2nd graders, and only 68% even for 6th graders.

Tada's study in 1968 had pointed out how difficult it is for children to understand symbolic images and the reversal of time expressed by overlapping images--and Kohno's experiment reconfirmed this finding.

From a similar viewpoint, Tsutomu Tsunekawa[54] conducted a test on nine groups of children, ranging from 1st graders to third-year junior high school students. While Kohno used a puppet play, Tsunekawa used a TV social-studies program tiled "My Town, Your Town," to check the children's abilities to distinguish "time" and "space" on TV. Tsunekawa found that the children's ability to arrange scenes in their order of appearance develops rapidly when the children reach the 5th grade in primary school. He also found that the ability to point out important scenes from among a number of photos has risen to 80% accuracy by the time children reach the 3rd grade.

Tsunekawa claims that, after children reach the 3rd grade, they become able to distinguish directions in space from scenes in a TV program. But, even though the TV program "My Town, Your Town" was intended for 3rd graders, only 36% of the 3rd graders surveyed were able to rearrange its scenes in the proper order. From this, Tsunekawa pointed

out certain problems in the production of this particular program for 3rd graders.

For some time, Masahiro Murakawa et al focused research on the TV series for schools titled "Green Earth." In 1984,[55] his team attempted an overall evaluation of the program, "Green Earth A Tidal Pool." They tried to clarify how the aims of the producers are expressed in the program's content, composition and imaging techniques, and to what extent these aims are conveyed to the children.

Their approach had four stages: (A) interviews with the producers, (B) analysis of the program, (C) analysis, using a program analyzer, of children's reactions while viewing, and (D) effectiveness tests conducted before and after viewing.

First, while watching "A Tidal Pool," the researchers talked with its producer about his aims in planning and producing this program. (The researchers also recorded this Stage A on videotape.) Then, in Stage B, the researchers analyzed the program in terms of such categories as "image information" (the subjects shot, the camera work, the sizes of shots, etc.), "written information" (i.e., subtitles) and "voice and sound information." In Stage C, the researchers used the program analyzer to measures students' "recognition reactions" ("I see" or "I don't understand") and emotional reactions (such as, "Interesting!" "Great!"). The researchers

also obtained the teachers' views on which points they considered most important in the program. Stage D was a viewing-effect test, which consisted of standard Surveys I and II.

After analyzing the data from Stages A and B, the researchers wrote as follows: "While wishing to make the viewers understand the content of the program through actual images, the producer nevertheless offers a great deal of extra explanation in both narration and subtitles, which tends to be excessive." However, in their overall evaluation, the researchers say that broad understanding of the program has been achieved almost completely.

This study--from data obtained with the analyzer and from the results of the pre- and post-viewing tests--also clarified the following points: (1) the memory of basic knowledge was low; (2) the use of special effects, such as frame-by-frame shots, proved effective; and (3) there was no marked difference in understanding according to the children's grade level, from the 6th grade to the 3rd year of junior high school.

Furthermore, the analysis of reactions, using the analyzer, showed a considerable difference between the scenes that the teachers thought were important and those which drew strong perceptive and emotional reactions from the

children. About this point, Murakawa et al have concluded: "Even though both the teachers and children share the same position as 'receivers,' there seems to be a qualitative gap in the influence they receive from the program."

In short, these recent studies on the development of viewing ability reconfirm that the ability to understand images develops with children's growth, and there is a big advance in such ability around the time from the 3rd to the 5th grade. Now, however, a number of practical studies are being conducted on the premise that children brought up in the television age are actually understanding more just by watching programs, even in the case of TV image compositions that grownups are unable to understand. The results of these studies have not yet been adequately reflected in the production of school-broadcast programs, which are each designated for viewing by a particular grade level. This, the author believes, is a major issue to be tackled by both program producers and researchers.

In the preceding five sections, the author has reviewed (1) research using program analysis, (2) experiments with test-production or re-editing of programs, (3) studies on teacher guidance and program effectiveness, (4) studies on the measurement and evaluation of viewing abilities, and

(5) studies concerning the development of viewing abilities. Naturally, this classification reflects the recent trends in research.

There are no longer many studies today in which a particular program is shwon to students in the particular grade for which it is intended, and then simply checked for overall effectiveness. Instead, it is more common today to analyze the contents of a particular program in detail, according to various criteria; in some cases, the program is changed in different ways for experiments. Furthermore, some studies take into account, as variables, the guidance methods of the teacher and previous learning by the chindren, as well as the developmental progress in the children's viewing ability and their individual differences.

6. Development of Curricula for Media Education

Until recently, audio-visual education has meant education by means of the media, such as broadcasting and movies. However, as image-based communication expanded dramatically and new educational media such as the personal computer made their debut, there has been a growing demand for education about the media.

In view of this trend, the 1973 meeting of the International Film and Television Council[56] gave the following definition: "Media education is study and teaching about

contemporary communication and expressional media; it is a specific and autonomous field of knowledge within the theory and practice of education, to be distinguished from the use of the media as an auxiliary tool for learning other fields such as mathematics, science or geography." In short, "media education" is not education by means of media but education concerning media.

In Japan, too, interest in media education has gradually increased. During the first half of the 1980's, two major research and development projects were carried out concerning media education. One was by the Educational System Study Group represented by Takashi Sakamoto, while the other was the Study on the Development of Curricula for Image Education by Sadasuke Yoshida et al.

Sakamoto et al[57][58] based their studies on the view that comprehensive media education develops the following abilities: the ability to understand media and to view it critically; the ability to make selective and effective use of media, even in combinations of various types; and the ability to produce media. Thus the researchers promoted the following six study guidelines:

(1) The aims and contents of media education will be derived from current guidance materials. When media education is given, subjects that can be taught effectively with media should be selected and arranged in proper order.

(2) The aims, contents and methods of media education will be classified by grade, and a curriculum will be compiled which treats media education as an independent subject.

(3) Pictorial materials suitable for this curriculum will be produced.

(4) A curriculum for educating teachers will also be developed.

(5) A curriculum for use in family education will be developed, and relevant teaching materials will be produced.

(6) When the opportunity arises for either the Study Guidance Procedures or the Standards for the Licensing of Teachers to be revised, efforts will be made to promote media education.

The Educational System Study Group includes both university researchers and the producers of educational programs at broadcasting stations. As can be seen from the above-mentioned list, the Group focuses on practical issues. The Group collected and rearranged material related to media education from the Study Guidance Procedures and textbooks for Japanese language and social studies. The Group also organized experimental classes in media education. Furthermore, the Group introduced knowledge about media education conducted in other countries. As a

result of the group's discussions, their concept of media education was summarized as follows:

"Media education teaches 'media literacy,' a concept that covers visual literacy, TV literacy and computer literacy. In other words, media education means the development of communication ability using the media. In particular, it should promote the ability to understand media, the ability to use media and the ability to produce media."

Some educational-program producers in this Study Group also planned to produce a program for use in conducting media education through broadcasting. Other group members compiled a social-studies curriculum which included media education.

Meanwhile, Teisuke Yoshida and Masaki Okabe[59] attempted to compile an image-education curriculum for all six years of primary school, with the aim of developing image-viewing ability in primary-school education, while keeping the children's developmental stages in mind.

The Study Group on Education by Broadcasting for Primary School Children at the Education Department of Kanazawa University, consisting of Yoshida et al,[60][61] started to prepare a curriculum for the formation of image-viewing ability, in a 3-year study beginning in fiscal 1980. As for

the domain of the image-education curriculum, the Group focused on Japanese-language courses in primary school, because they considered that written words and images are both means of conveying information. In addition to "understanding" and "expression" (the study objectives in the case the Japanese language), "emotional response" was included in the case of "image-education." Thus, in image-education, the following three fields of study have been defined: recognization aspects ("structual understanding"and "intuitive understanding"); emotional aspects ("amplification of feeling," "individualization of feeling" and "diversification of feeling"); and expressional, technical and behavioral aspects ("expression of what has been understood," "creative expression," "technical expression" and "production methods").

The Yoshida group, instead of teaching these fields individually, produced a "guidance package" combining a number of different factors in order to promote image-education more effectively. They adopted such materials as school-broadcast programs, general TV programs, movies, cartoons, and advertisements.

In order to study the effects of this media-education curriculum, Yoshida and Okabe[62][63] used it for one year for 5th graders, while checking whether or not the children developed new kinds of viewing abilities. The researchers

focused on (1) increase in the children's viewing ability for TV school-broadcasts used in classes and (2) changes in viewing ability for TV programs normally viewed at home. After this one-year experiment, their report said, among other things, that children's awareness of theme music and background music was enhanced, and children tended to compare their own ways of thinking with those of the characters appearing in the programs viewed.

Since then, Okabe[64] has proposed an image-production curriculum for children in the higher grades of primary school. Okabe classified image-producing ability in three fields: understanding, assembly, and putting-across. And he then subdivided each of these three fields into three specific types of action; for example, "understanding" was divided into "recognition of the present situation," "judgment of the present situation" and "development of a theme." On this basis, Okabe composed a guidance curriculum. He wrote: "I believe the compilation of a curriculum by dividing the ability to express oneself through images into 'viewing ability as an expression of reactions' and 'producing ability as creative expression' has marked a step forward from the conventional approach centered on simple viewing ability."

Following Okabe, Yoshida[65] of the Study Group for

Education by Broadcasting at Kanazawa University published the results of his study using textbooks and images in combination, i.e., a multi-media approach, in contrast to studies aimed developing the ability to learn about images solely through the use of images.

Yoshida[66] in 1985 made primary school children in both an urban area and a mountain village view regularly two series of TV school-broadcast general study programs, "The Family of Man" and "The Green Earth," while using a revised version of the image-education curriculum previously worked out by Yoshida et al. For this study, he disregarded the conventional divisions between the grades, and used Japanese-language textbooks in a media-mix. Yoshida wrote in his report: "In the case of the primary school in the urban area, I saw to it that the study plans for the children were designed to promote the expansion of thinking habits along the lines offered by multi-media. In the mountain-village school, I made sure that there was also emphasis on elements in the children's daily life, including the need to make effective use of the natural environment, and time-honored traditions."

The studies by Yoshida[67] et al on the production of a series of image-education curricula have already been made public in the form of Guide Books for Primary School Teachers

(in six volumes, one for each grade.) By using these books in combination with packaged teaching materials, practical media-education has already become a part of day-to-day teaching at many primary schools. As Sakamoto and his group point out, the problem from now on will be how to incorporate effectively the results of the above studies on "media education" into the Study Guidance Procedures.

7. Development of New Programs for Very Young Children

At the initial stage of studies on education by broadcasting, many experimental studies were conducted with the aim of developing new programs. (The study by Iwao et al introduced earlier in this paper is one example.)

Then, after a hiatus of a dozen or so years, three groups began in the late 1970's to concentrate on the development of TV programs for pre-school children. The Study Group on TV Programs for Two-year-olds (represented by Tsuné Shirai) conducted a series of experiments on a number of segments from the NHK children's series, "With Mother." NHK's Broadcast Culture Research Institute also worked on the development of programs for very young children, and the Infant Education Division of the Fuji Telecasting Company conducted studies on one of its own children's programs, "Hirake! Ponkikki!"

The Study Group on TV Programs for Two-year-olds has been engaged since 1979 mainly in test-producing and evaluating TV programs for very young children. According to the NHK Public Opinion Research Institute's survey (1980), the average daily TV viewing time of two-year-olds is two hours and 15 minutes. The survey also showed that almost all of the TV programs they viewed were either designed for very young children like themselves or animated cartoons for older children. On the other hand, two-year-olds are at a crucial developmental stage, when they develop imitative behavior and the foundation for imaginative power and concept formation. Therefore, the proper use of television can be extremely meaningful.

With this goal in mind, a number of psychologists, program-producers and research specialists teamed up and conducted studies in three areas: (1) establishing educational and behavioral objectives, (2) surveying the actual behavior of very young children, and (3) test-producing programs and conducting experiments using such programs. In this report, the author will focus on the latter area.

In this group's first study,[69] the researchers extracted from various song programs, cartoons, advertisements and so on, a total of 61 short segments which, from experience, were considered likely to attract the interest of

children from two to three years old. Then, using the distractor method, those segments were shown to 50 children from two or three years of age, and the children's reactions were checked. As a result, it was found that the children's attentiveness rate rose for scenes in which human beings or animals appeared, those in which there was no movement of the camera but active movement by characters , and those in which some counting of things took place.

In the group's second study,[70] several variations were produced of a segment in which three things were counted, since the attentiveness rate for this had been high in the first study. Then the attentiveness rates for the variation segments were checked. As a result, it was clarified that what attracted the children's attention was the action itself of counting things, rather than the composition of the images projected, the kinds of objects shown on the screen (toys, food, etc.) or the accompanying humorous conversations.

In the group's third study,[71] attentiveness rates and imitative actions were checked with regard to short segments on "tooth-brushing," "work" and "picture-drawing songs." (The results showed some difference by sex in imitative actions and the attentiveness rate for the segment about "work.")

In their fourth study,[72] the researchers used some video programs they had produced on their own from short

stories for very young children, such as "The Big Turnip" and "The Adventure of a Baby Sparrow." They varied such factors as the length of the segment, the complexity of the pictures, the camera-work and the narration. It was found that, in the case of the youngest children, the attentiveness rate was high for segments which were short, containing simple pictures with quick movements, and accompanied by easy-to-understand narration.

Then, in their fifth study,[73] the researchers conducted a series of tests using eight experimental segments which they had produced with variations in such factors as the performers, actions and background. The segments portrayed simple physical exercises for children, inspired by Yoga. Later, the "Hai, Pose!" sequence, based on the results of the fifth study, came to be used as a part of NHK's series "With Mother." The results of all five studies described above were reported in the publication, "What Can Television Do for Young Children?"[74] compiled by Tsuné Shirai and Takashi Sakamoto in 1982. After that, the group continued its studies in various fields, such as the use of computer graphics, and a U.S.-Japan comparative study in children's programs, using segments from "Sesame Street."

Just around the same time, the NHK Broadcast Culture Research Institute conducted a series of experimental

development studies on children in a wider age range, using the same distractor method adopted by the Study Group on TV Programs for Two-year-olds.

The first study[75] conducted by the NHK Broadcast Culture Research Institute was of the same type as the fourth study by the Study Group on TV Programs for the Two-year-olds, but conducted on children in a wider age-range. Variations of a video program based on a short story were produced varying two conditions--realistic vs. abstract pictures, and detailed vs. simple narration. By combining the four conditions in various ways, they produced different types of programs, then showed these to children in the age-range from 3 to 6 and checked their attentiveness rates. It was found that the children's attentiveness rates were the highest for the program with abstract pictures and simple narration. Thus, the data obtained proved to be similar to those obtained by the Study Group on TV Programs for Two-year-olds.

In its second study,[76] the NHK Broadcast Culture Research Institute test-produced two picture-pattern programs (each with different sound-tracks), and several photo programs and film programs--all dealing with the growth of a butterfly or scenes of airplanes. Using these programs, they checked the attentiveness rates of children in the age range from two to five, employing the same method as in the first

study. In the experiment using the program about the butterfly, the children showed the highest attentiveness rate for the picture-pattern program in all age groups. However, recollection of the order of the butterfly's metamorphosis was found to be difficult even for the 5-year-olds.

III. Practical Studies by Teachers on Education by Broadcasting

The School-broadcast Education Prize has been awarded annually since 1964 to the authors of outstanding theses on education by broadcasting by Zenporen, the All-Japan Teacher's Federation for Studying the Use of Radio and Television in Education. (As of fiscal 1985, the title of this prize was changed to the "Education-by-Broadcasting Prize.")

Each year, some 100 entries are made for this award by teachers at kindergartens, primary schools, junior and senior high schools, schools for the handicapped, and even Japanese schools overseas. Thus the total number of theses entered in this annual competition is estimated to have reached several thousand. Fumio Nishimura, Vice President of Zenporen, says two main types of theses were entered for the fiscal 1985 award. In one type, the author discusses the significance and contents of education by broadcasting based on his or her own research and practice over many years. In the other

type of study, attention is focused on a particular program and ways of viewing it, and how to pursue an extended study in connection with the viewing of this program. The Zenporen Vice President also points out that, while most of the previous entries were based on the teacher's subjective evaluations, many of the 1985 entrants had studied the children's reactions with considerable objectivity and scientific reasoning. This trend can be considered quite desirable.

Among the prize-winning entries in the 1985 competition, Tetsuo Okamoto, a teacher at the Kusatsu city Tamagawa Primary School in Shiga Prefecture reported on his research in which he made effective use of what he called "Aré, aré cards" ("aré" being a Japanese exclamation expressing wonder or doubt). The intention of Okamoto in using these cards, distributed to the children when they were viewing "Science Classroom" programs, was to draw out the children's thoughts, such as, "Say, that's funny!" or "I want to have a closer look at that question."

Another study made by Ken-ichiro Hirohato, a teacher at Setagaya ward Matsuzawa Primary School in Tokyo, made use of a TV social-studies program for primary schools, "Report Nippon." In order to help achieve the type of "social studies that motivate children to study more about

the world," he had the children make self-evaluations of progress in their studies, by means of cards distributed to each child at the time of the program-viewing. Hirohato says in his thesis that this was an attempt to help all children become interested in social studies.

The titles of the prize-winning theses in the kindergarten, nursery school and primary school divisions from the 1975-85 competitions are listed in Tables 1 to 6. These theses are the results of studies done by individual teachers with children in their respective classes as the subjects, in the course of their daily teaching activities. It is regrettable that the contents of the theses cannot be generalized. Even so, the large number of teachers engaged in such practical studies have helped to support both the continuous development of education by broadcasting and the high level of studies on education by broadcasting in Japan.

IV. Conclusion

In the studies on education by broadcasting in Japan, two types of surveys have been conducted on a continuous and comprehensive basis: (1) those by the NHK Broadcast Culture Research Institute and the various study groups working in different parts of the country; and (2) surveys on how school-broadcasts are actually used, especially surveys by

teachers about the use of broadcasting in their classrooms. The present report has omitted surveys on the actual condition of the use of broadcasting in schools and other related questions, but the author wishes to point out that the utilization rates of school-broadcast programs (that is, audience ratings) also represent an evaluation of programs in a wider sense, and that the responses given by the groups of teachers to the questionnaire surveys on individual programs are also a kind of program evaluation. It seems certain that, along with the types of studies mentioned above, ever-increasing importance will be attached to studies which analyze the structure of programs.

While visual teaching-materials until the latter half of the 1970's were almost entirely TV broadcasts, the use of video teaching-materials and self-produced teaching materials has increased sharply in the 1980's, so it has now reached almost the same level as that of broadcast teaching-materials. Thus, the quality of broadcast programs has come to be looked at with an increasingly critical eye.

Previously, possibly as a result of the trend to emphasize the special characteristics of broadcasting as a medium of communication, the arguments about education by broadcasting tended to neglect examination of the actual contents of programs.(78) Today, however, as the use of

school-broadcast programs after first taping them has became more and more common, and as the video teaching-materials come to be used side by side with the broadcasts, the quality of broadcast programs has come to be judged on the value of their material, rather than their special features as a telecommunications medium. In this connection, the author believes that more and more studies should be done on broadcasting programs from various viewpoints, following the lead of the studies taken up in this report.

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